

## Relations industrielles Industrial Relations



# Workplace Violence and the Duration of Workers' Compensation Claims

## La violence sur les lieux de travail et la durée des réclamations des travailleurs

## Violencia en el trabajo y duración del reclamo compensatorio de los trabajadores

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Volume 63, numéro 1, hiver 2008

URI : <https://id.erudit.org/iderudit/018122ar>

DOI : <https://doi.org/10.7202/018122ar>

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Éditeur(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (imprimé)

1703-8138 (numérique)

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Citer cet article

Campolieti, M., Goldenberg, J. & Hyatt, D. (2008). Workplace Violence and the Duration of Workers' Compensation Claims. *Relations industrielles / Industrial Relations*, 63(1), 57–84. <https://doi.org/10.7202/018122ar>

### Résumé de l'article

Une étude récente de Statistique Canada (2007) offre une illustration alarmante de l'ampleur de la victimisation criminelle sur les lieux de travail. Les Canadiens y signalent quelque 350 000 incidents de violence dans leurs établissements. Selon Statistique Canada (2007 : 6), ces incidents représentent 17 % de tous les incidents déclarés de victimisation avec violence, incluant l'agression sexuelle, le vol et les voies de fait. Cette étude démontre que la violence sur les lieux de travail est beaucoup plus répandue que les gestes isolés, spectaculaires et parfois mortels de violence sur les lieux de travail signalés à l'occasion dans les quotidiens.

L'étude de Statistique Canada révèle également que certaines occupations sont plus exposées à la violence sur les lieux de travail que d'autres. Les travailleurs de l'aide sociale et de la santé, ainsi que ceux des services alimentaires et du logement, sont particulièrement exposés à des gestes de violence dans leurs établissements.

Les victimes de gestes de violence sur les lieux de travail sont traitées de façon différente de celles qui ont subi des actes de violence hors des lieux de travail, en ce sens que toute lésion d'ordre physique, psychologique et émotionnelle, que toute perte de gains due à une absence du travail comme conséquence de la violence sont indemnisables en vertu du système d'indemnisation des travailleurs. Ce système d'indemnisation des travailleurs est créé par voie législative selon un programme d'assurance sans égard à la responsabilité, qui compense des frais de réhabilitation soit occupationnelle, soit médicale, qui prévoit des dédommagements en cas de perte de rémunération dans le cas de travailleurs qui sont devenus incapables suite à une lésion ou une maladie liée travail.

En matière d'indemnisation des travailleurs, le législateur aurait intérêt à comprendre les causes et les conséquences des incidents de violence sur les lieux de travail. Cette compréhension pourrait guider les autorités en matière d'indemnisation des travailleurs dans l'élaboration des stratégies visant à prévenir la violence dans les établissements et à aider à en limiter les conséquences liées à l'incapacité, incluant les pertes de temps au travail. L'intérêt primordial pour les autorités responsables de l'indemnisation des travailleurs à l'endroit d'une meilleure compréhension de la violence est certainement de mieux assurer la protection des travailleurs. Mais, il y a aussi un intérêt de nature financière. Évidemment, aucune indemnisation ne serait nécessaire s'il n'y avait pas de violence. Cependant, même lorsqu'un acte de violence se produit, le fait de promouvoir ou de faciliter le retour au travail en temps opportun pourrait réduire les coûts des paiements de remplacement du revenu prévus dans le système d'indemnisation des travailleurs.

Alors qu'un nombre d'études antérieures ont documenté la fréquence des actes de violence dans les établissements et quelques unes des conséquences pour les victimes, il n'y a eu que très peu de recherches sur le déclencheur principal des coûts financiers associés à la violence sur les lieux de travail, c'est-à-dire la durée des absences du travail engendrée par les conséquences de la violence en termes d'invalidité. Cet essai présente une évaluation des causes du temps de travail perdu à la suite d'un geste de violence sur les lieux de travail. Nous utilisons un modèle de risque pour rendre compte de la durée de ces absences du travail. Nous contrôlons l'élément d'hétérogénéité inobservée qui peut fausser les évaluations des paramètres du modèle de risque. Nous constatons que, lorsque la variable hétérogénéité inobservée est incluse dans les caractéristiques du modèle, certaines évaluations concernant les occupations à haut risque (par exemple, les infirmières et les agents de police) présentent des différences importantes quand on les compare à leurs homologues dans le même modèle, mais dont le devis descriptif ne fait pas état de l'hétérogénéité inobservée. Cela nous laisse croire que les facteurs passés sous silence, tels que le stress et les problèmes psychologiques peuvent exercer une influence importante sur les évaluations.

Nous avons obtenu ces évaluations en utilisant des données tirées des archives administratives de la Commission ontarienne de la sécurité professionnelle et de l'assurance contre les accidents du travail. Elles font état des réclamations d'indemnisation des travailleurs suite à des incidents non mortels comportant des pertes de temps pour les travailleurs qui ont subi des lésions au cours de leur travail résultant de gestes de violence. Les types de violence qu'on retrouve dans ces données comprennent des actes physiques, tels que des morsures, des racles, des coups de couteau ou de fusil et des voies de fait. Notre échantillon comprend 4 457 réclamations d'indemnisation des travailleurs.

La durée des réclamations qui proviennent d'actes de violence au travail mérite qu'on lui accorde une analyse distincte de celle des autres types de lésions associées au travail (ces dernières faisant l'objet d'une littérature assez remarquable). Les données retenues dans cette étude indiquent que la durée des absences du travail résultant d'incidents de violence sur les lieux de travail est cinquante pour cent plus longue que celle des absences dues à d'autres lésions ou maladies professionnelles.

Nos principales conclusions d'ordre empirique laissent croire à la présence d'une quantité de relations significatives entre les caractéristiques des individus, les réclamations et la durée des absences du travail venant de la violence au travail. En premier lieu, nous constatons que le fait d'accroître la gravité de la lésion, évaluée en termes de dépenses totales en frais de santé, est relié à des augmentations de la durée des absences du travail. En deuxième lieu, nous découvrons que les incidents les plus violents auraient tendance à s'associer à des diminutions les plus prononcées du taux de risque et résulteraient dans des absences plus longues du travail. En troisième lieu, nous avons observé des différences significatives dans les taux de risque par type d'occupation. Plus précisément, les occupations à haut risque, telles que les infirmières et les agents de police, présentent des dossiers d'absences du travail plus longues. Quatrièmement, nous avons constaté que les travailleurs à l'emploi des établissements plus vastes ont un fichier d'absences plus courtes au cours de la période suivant un épisode de violence au travail.

Ce travail fournit de l'information valable sur les facteurs qui ont un impact sur la longueur des absences du travail à la suite d'un incident de violence au travail. Par conséquent, il conduit à une meilleure compréhension des facteurs influençant la survenance d'incidents de violence au travail et la durée des absences du travail suivant un épisode de violence. Cependant, un secteur qui n'a pas été abordé concerne le type de services qui devraient être offerts aux travailleurs victimes de violence. Dans la mesure où ces services peuvent réduire la durée des absences du travail, on y trouve là un grand intérêt à la fois pour les employeurs et les commissions d'indemnisation. Peut-être et de façon plus significative, ils pourraient aider les victimes dans leur vie personnelle et à un retour au travail plus rapide par une réduction des conséquences néfastes de la violence au travail. Voilà une avenue importante et prometteuse pour la recherche ultérieure.

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# *Workplace Violence and the Duration of Workers' Compensation Claims*

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*Based upon unique Canadian administrative data from the years 1996 to 1999, this study examines the duration of absences from work due to injuries arising from workplace violence with a hazard model. We find that policing and nursing occupations, larger health care expenditures and more severe acts of violence are associated with longer absences from work. On the other hand, workers from larger firms have shorter absences from work. Our estimates are also quite sensitive to the inclusion of unobserved heterogeneity distribution, i.e., an individual specific random effect. This suggests that unobservable factors, such as stress and psychological or psychosomatic problems resulting from the workplace violence could have a large impact on the duration of work absences.*

A recent study (Statistics Canada, 2007) offered an extensive and alarming illustration of the extent of criminal victimization in the workplace.

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  - Dara Chappel provided excellent research assistance on this project. Campolieti gratefully acknowledges the research support of the Social Science and Humanities Research Council of Canada. The data from the Workplace Safety & Insurance Board (WSIB) of Ontario's administrative records was provided by the Institute for Work & Health (IWH). The views expressed in this paper do not represent the views of either the WSIB or the IWH.

Canadians reported some 350,000 incidents of violence in their workplaces in 2004. According to Statistics Canada (2007: 6), these incidents represent, “17% of all self-reported incidents of violent victimization, including sexual assault, robbery and physical assault.” This study provides evidence that workplace violence is far more pervasive than the spectacularly violent and deadly acts of workplace violence that are occasionally reported on in the evening news.

The Statistics Canada study also confirmed that some occupations are more prone to workplace violence than others. Social assistance and healthcare workers, along with those employed in accommodation and food services occupations were particularly prone to acts of violence in their workplaces.

Those who are victimized by violence in the workplace are treated differently than those who suffer violent acts outside of the workplace in that any physical or psychological/emotional injury, and any lost earnings due to absence from work, as a consequence of violence is compensable under the workers’ compensation system. Workers’ compensation is a legislatively-mandated no-fault insurance program that pays for medical and vocational rehabilitation, and provides wage loss payments, for workers who are disabled as a result of a work-related injury or disease.

As a workers’ compensation issue, policy makers have an interest in understanding the causes and consequences of incidents of workplace violence. This understanding may lead workers’ compensation authorities to strategies for preventing workplace violence, and for limiting the disabling consequences, including time lost from work. The primary incentive for workers’ compensation authorities to better understand violence at work is certainly to protect workers. However, there is also a financial incentive. Clearly, there are no financial costs to the workers’ compensation system if violence can be prevented. As well, even when a violent act does occur, encouraging and facilitating a timely return to work will reduce the costs to the workers’ compensation system of income replacement benefits.

While a number of previous studies have documented the frequency of acts of workplace violence and some of the consequences for its victims, there has been very little work on a key driver of the financial costs of workplace violence—the duration of absence from work resulting from the disabling consequences of violent acts. Based upon data on injuries resulting from workplace violence between 1996 and 1999, drawn from the administrative records of the Ontario Workplace Safety & Insurance Board (WSIB), this paper provides estimates of the determinants of time lost from work following an act of workplace violence. Importantly, we control for unobserved heterogeneity that may bias parameter estimates of the duration models. We find that when unobserved heterogeneity is

included in the specification of the hazard model, some of the estimates for high-risk occupations (e.g., nursing and police officers) differ substantially from their counterparts in a specification without unobserved heterogeneity. This suggests that the unobserved factors, such as stress and psychological problems, might also have a large impact on the estimates.

The duration of workers' compensation claims arising from workplace violence merits separate analysis from the duration of other types of work-related injuries (the latter itself is a subject of a sizable literature). The data used in this study indicate that the duration of absence from work associated with incidents of workplace violence is about 50 percent longer than for absences due to other workplace injuries and diseases.<sup>1</sup>

The next section of the paper contains a brief review of some current research on workplace violence. We present in the third section a description of the empirical methods we use and our data in the fourth section. The empirical results are presented in the fifth section followed by a discussion of our key findings and how they related to previous research on workplace violence. We conclude the paper with summary comments and a discussion of the implications of our findings.

### ***PREVIOUS RESEARCH***

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A number of studies have examined workplace violence in the last decade. These studies have focused for the most part on the factors associated with increases in the prevalence/incidence of violence as well as the consequences of this violence. In contrast, very few studies have looked at the duration of the absences from work caused by workplace violence, which is the focus of our analysis. This paper will provide a review of some of the key findings in the literature from the last two decades.<sup>2</sup> Most of this previous research has been conducted using data from the United States and other countries, but there have been some Canadian studies. We provide a review of the U.S. and international evidence prior to discussing the Canadian evidence.

In terms of profiling the incidence of workplace violence, Chenier (1998) used Bureau of Labor Statistics data and Occupational Safety and Health Administration guidelines to assess which occupations were most likely to experience violence at work and to determine what workplace

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1. For example, in 1999, the average duration of a workplace violence-related workers' compensation claim was 14.5 days, compared to 21.7 days for all workers' claims for which time was lost from work.
  2. Dupre and Barling (2003) provide a more extensive and detailed summary of this literature.

factors precipitated violence. The study found that taxi cab drivers were the most vulnerable. Other dangerous occupations included health care workers and employees of small retail stores.

In a similar vein, the National Institute for Occupational Safety and Health (1996) statistical bulletin provided some comprehensive descriptive information on workplace violence in the United States. The findings in this report indicate that retail industries and nursing-home workers experienced the highest incidence of non-fatal assaults, and that 56 percent of the victims of non-fatal violence were women. This report also provides some information on the duration of absences from work that resulted from workplace violence. Specifically, the median absence from work for victims of these beatings was five days. However, the median days away from work did vary by type of violence; 30 days for shootings, 28 days for stabbings, 3 days for biting and 4 days for squeezing, pinching, scratching or twists.

Other contributions to the literature have focused on determining the groups most likely to experience violence. For example, Saarela and Isotalus (1999) were interested in determining which occupations face the greatest danger of workplace violence with Finnish data. They found that some 4.1 percent of the workers interviewed had experienced violence or the threat of violence in the last 12 months. Episodes of violence in the health care and social services occupations accounted for 10.5 percent of all reported incidents. Workers in transportation occupations (drivers of buses, street cars, taxis, trucks, etc.) and service industry occupations accounted for 13.6 percent of the incidents of violence in their sample (6.8 percent each). Lord (1998) examined a stratified sample of 1,477 full-time state government employees (including university workers) in North Carolina in order to identify the occupations with the highest potential risk to encounter violence in the workplace. Overall, 22 percent of North Carolina's state government employees reported that they had been victims of some form of violence. The study also found that workers in protective services and law enforcement as well as professionals and administrators who work with patients have greater exposure to violence. Males were more likely to be victimized than females, but there were very few differences in incidence due to ethnicity. In addition, almost half (47.4%) of the victims were between 40 and 55 years old. Finally, the most frequent types of violence were the least severe. Specifically, verbal abuse was the most frequent type of violent act reported (83.2%).

One limitation of the earlier studies profiling workplace violence is that they were often based on surveys of limited populations. However, a few of the more recent studies have used data from the administrative records of workers' compensation boards to examine the incidence and composition of claims. The benefit of the administrative data from workers' compensation

boards is that they provide a census of all reported claims, rather than a sample of the population.

Islam *et al.* (2003) examine workplace injury claims resulting from physical assault using data from administrative records of the West Virginia Workers' Compensation Board covering the period between July 1, 1997 and June 30, 1999. Islam *et al.* (2003) found that health care workers had the highest incidence of physical assaults at work. The other occupations that had a high incidence of physical assault were public safety and teaching. In fact, health care, public safety and teaching occupations accounted for about 75 percent of the victims of physical assault.

McCall and Horowitz (2004) examine workers' compensation claim data from the Oregon Department of Consumer and Business Information and Management Division from 1990 to 1997. McCall and Horowitz (2004) found a number of interesting trends in their data. Women tended to be more frequently victims of workplace violence (about 56 percent of workplace violence claims). Second, occupations such as nursing and law enforcement had the highest claim rates, 46.4 claims per 10,000 workers and 45.6 claims per 10,000 workers (respectively). Third, the average days away from work was 39.4 days, with women having longer absences from work than men (44 versus 33.5 days).

These contributions to the literature have clearly indicated that some occupations are at greater risk for being victims of workplace violence. Workers in the health care sector, particularly those in nursing, are especially prone to being subjected to workplace violence. A number of studies specific to the health care sector have looked more closely at the incidence of workplace violence in this sector.

Elliott (1997) found that a nurse's risk of being a victim of workplace violence is 16 times greater than the national average in the United States. Similarly, Gates (2004) reports that 59 percent of nurses aides report being assaulted at least once a week, while 16 percent report being assaulted daily. Stirling, Higgins and Cooke (2001) reported that in a survey of Florida emergency room departments, 71.9 percent of respondents had been assaulted at some point in their career, with 41.5 percent reporting being assaulted in the last year. Bensley *et al.* (1997) look at data from a psychiatric hospital in the United States to examine the incidence and effects of workplace violence in that workplace. They found an incidence rate of 23 workers' compensation claims per 100 workers in this workplace due to workplace violence, with average claim duration of about 19 days. Their analyses also found that mental health technicians were especially prone to an increase in the incidence and severity of claims.

These findings of nurses being more prone to workplace violence are not specific to the United States. The issue of workplace violence in nursing

occupations figures prominently in Statistics Canada's survey of nursing in Canada (Statistics Canada, 2005). Specially, 29 percent of the nurses in Canada reported being assaulted by a patient in the previous 12 months. Similarly, 44 percent of nurses in Canada reported being emotionally abused in the previous 12 months by a patient, visitor, physician or another nurse. Hesketh *et al.* (2003) conducted a large survey (sample size of 6,526) of nurses in Alberta and British Columbia and found that nurses face a great deal of workplace violence. Their results indicate that nurses in emergency room and psychiatric units face the greatest risk of physical assault and threat of physical assault. In fact, 54.2 percent of nurses in psychiatric units reported being physically assaulted in their last five shifts. However, they also found that the workplace violence was not just occurring with nurses in psychiatric and emergency room units, nurses in other types of units (e.g., medical/surgical and critical care) were also victimized a great deal.

While social workers are not at the top of the list of high-risk occupations in the United States (McCall and Horowitz, 2004), they are more likely to be victims of workplace violence in Canada. MacDonald and Sirotych (2005) collected data on Canadian social workers' experiences with workplace violence. Their data indicated that about 56.1 percent of the sample was verbally harassed and 19.6 percent had been threatened with physical harm over the last two years. However, when the frame of reference was their career, 87.8 percent had been verbally harassed at some point and 63.5 percent had been threatened.

In a seminal study, Budd, Arvey and Lawless (1996) used data from a telephone survey conducted by Northwestern National Life Insurance Company to examine the incidence of workplace violence and its effect on workers. Their logit estimates indicated that demographic and job characteristics were not statistically significant correlates of workplace violence. While Budd, Arvey and Lawless (1996) did not find many correlates of workplace violence, they did find many consequences of violence, such as job dissatisfaction, turnover intentions, worrying about violence, distress and declines in productivity. The consequences of the violence in employee or organizational outcomes are not trivial. For example, Pizzino (1993) found that, based on data collected by the Canadian Union of Public Employees, 60.7 percent of victims from aggression reported suffering emotional trauma.

Budd, Arvey and Lawless (1996) noted that their study was one of the first pieces of research in this area, so issues such as the selection of the sample and the psychometric properties of the measures would need to be examined and refined in future studies. There have been a few studies that have begun to make the refinements suggested by Budd, Arvey and Lawless (1996). While there have been some U.S. studies, we focus primarily on the Canadian studies because the data we will be analyzing is also from Canada.

Jockin, Arvey and McGue (2001) looked at the factors influencing the incidence of workplace violence and aggression. More specifically, they looked at the impact of biological and psychological factors associated with aggression, for example, a history of anti-social behaviour, personality (i.e., low agreeableness, high neuroticism and low conscientiousness), alcohol consumption and perceptions of victimization. They used data drawn from a subsample of the Minnesota Twin Registry Twin Parenting Project (a study of life outcomes of men born between 1961 and 1964). Jockin, Arvey and McGue (2001) found that past anti-social behaviour, alcohol abuse and several dimensions of personality are associated with increases in the likelihood of workplace aggression and conflict, particularly when the individual perceives themselves as being victimized by others.

Rogers and Kelloway (1997) examined the impact of workplace violence on individuals and organizations. They surveyed customer service representatives from a Canadian financial institution. Their findings indicated that workplace violence contributes to an increase in the fear of future violence, which is in turn associated with increases in turnover intentions, decreases in mental health and increases in physical problems. In a related study, Schat and Kelloway (2000) used two samples (hospital staff and workers at a group home for the developmentally disabled) to look at the effects of different dimensions of perceived control on personal and organizational outcomes. In addition, they also examined the psychometric properties of a scale used to examine the dimensions of perceived control. The principal findings in this paper are consistent with those in Rogers and Kelloway (1997).

Greenberg and Barling (1999) used data on male workers from a Canadian university to look at the effect of behavioural and workplace factors on workplace aggression against coworkers, subordinates and supervisors. Like Budd, Arvey and Lawless (1996), they found that demographic factors were not statistically significant determinants of aggression against coworkers, subordinates or supervisors. However, like Jockin, Arvey and McGue (2001), they did find that a history of aggressive behaviour and alcohol consumption was associated with increased workplace aggression against coworkers.

Barling, Rogers and Kelloway (2001) look at the effects of workplace violence and sexual harassment on worker outcomes, based on data collected on workers in the in-home health care sector (primarily, nurses, social workers, child management specialists, and behaviour management specialists) from a Canadian province. Their findings indicated that workplace violence and sexual harassment predict fear of their recurrence in the workplace, which in turn predicts negative mood (anxiety and anger) and perceptions of injustice. Moreover, fear, negative mood, and perceived



injustice also predict lower affective commitment and enhanced withdrawal intentions, poor interpersonal job performance, greater neglect and cognitive difficulties.

LeBlanc and Kelloway (2002) further examine some of the consequences of workplace violence using data collected from a number of different organizations. They made the distinction between the sources of the violence (i.e., co-workers versus non-co-worker). Their principal findings indicate that co-worker aggression is associated with decreases in emotional and psychological well-being as well as with decreases in affective commitment to the organization. They also found that non-co-worker violence is associated with an increase in turnover. LeBlanc and Barling (2004) suggest that the difference between co-worker and non-co-worker aggression is an important direction for future research. In particular, they noted that the source of the violence seems to have different effects on individual and organization outcomes.

Dupre and Barling (2006) look at workplace violence directed at supervisors by employees and its prevention. The findings in Dupre and Barling (2006) suggest that perceived injustice leads to workplace aggression. However, this aggression/violence appears to be reduced when individuals believe the organization will take action against workplace violence. This suggests that organizational sanctions against workers who engage in aggressive behaviour towards fellow workers can reduce the incidence of these actions.

### ***EMPIRICAL METHODS***

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We examine the duration of workplace violence-related work absences using hazard models in which work absences are measured by the number of days the injured worker is in receipt of workers' compensation temporary total disability benefits.<sup>3</sup> These models are frequently used in economics and industrial relations to examine events such as the duration of workers' compensation claims (Campolieti, 2001), unemployment spells (Ham and Rea, 1987) and strikes (Gunderson and Melino, 1990; Campolieti, Hebdon and Hyatt, 2005). Hazard models estimate the conditional exit probabilities—for example, the probability of returning to work on the 10<sup>th</sup> day conditional on having been absent from work for 9 days.

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3. Note that in Ontario, Canada, the source of data for this study, temporary total disability benefits are paid commencing on the next work day following the injury. (The employer is obliged, under the governing legislation, to pay the injured worker their full pay for the day of the accident.) Consequently, there is no "waiting period" for benefits in this jurisdiction.

A Weibull specification of the hazard rate (where  $h_i(t)$  is the hazard rate or probability for individual  $i$  at time  $t$ ) is given by:

$$h_i(t) = \exp\left(X_i(t)' \beta\right) \alpha t^{\alpha-1}, \quad (1)$$

where  $X_i(t)$  is a set of controls for individual characteristics and  $\alpha$  is the duration dependence parameter. If  $\alpha < 1$  then work absence due to violence exhibits a negative duration dependence, i.e., the individual is less likely to return to work the longer they remain away from work. Alternatively, if  $\alpha > 1$  work absence due to violence exhibits a positive duration dependence, i.e., the individual is more likely to return to work the longer they remain away from work. Finally, if the duration dependence parameter equals 1, then there is no duration dependence, i.e., the conditional probability of returning to work does not depend on time.

The Weibull specification is a proportional hazards model so that the explanatory variables have a multiplicative or proportional effect on the hazard rate. Consequently, the estimates from the proportional hazard model are often interpreted in terms of hazard rate ratios, which measure the percentage increase in the hazard, i.e., the conditional probability of exiting, associated with an explanatory variable. For example, if the control for males had a hazard ratio of 1.05 then males would be associated with a 5 percent increase in the hazard, relative to women. The hazard rate ratios are computed as the exponentiated values of the coefficient estimates,  $\exp(\hat{\beta}_i)$ . Also, if an explanatory variable is associated with an increase in the conditional probability of exiting an absence from work, then it is also associated with a reduction in the expected duration of an absence from work.

One issue that has received a great deal of attention in the econometric analysis of duration data is unobserved heterogeneity. Unobserved heterogeneity can arise because of the misspecification of the functional form of the hazard model as well as the omission of important, but perhaps unobservable, explanatory variables. Ignoring the unobserved heterogeneity would result in biased parameter estimates. For example, Barling (1996) argued that exposure to workplace violence could lead to increased stress levels. This stress might impair the employee's ability to work and could also result in health problems, which might be associated with increased drinking and smoking. In addition, the stress might also lead to severe psychological and psychosomatic problems. Other researchers examining the consequences of workplace violence have also come to similar conclusions. For example, Budd, Arvey and Lawless (1996) found that experiencing workplace violence was associated with a significantly higher likelihood of worrying about violence as well as contributing to a

significant reduction in job satisfaction. In addition, they found that fear of violence was associated with considering job changes, distress and reduced productivity. Similarly, Rogers and Kelloway (1997) found that experiencing workplace violence can lead to greater fear in the workplace, which can increase turnover intentions and reduce psychological and physical health. Unfortunately, administrative data sources, such as the one used in this paper, do not contain information on the consequences of workplace violence. This means that an alternative approach must be taken to control for these factors.

In the econometric literature, the approach to deal with these issues has been to include an individual specific random effect in the specification of the hazard model. More specifically, we incorporate a multiplicative random effect, denoted  $v$ , in equation (1)

$$h_i(t | v) = v \exp \left( X_i(t)' \beta \right) \alpha t^{\alpha-1} \quad (2)$$

where  $v$  is greater than zero and has a gamma distribution with mean 1 and variance  $\sigma^2$ . The gamma distribution is frequently used primarily for mathematical and computational ease. If the variance of the unobserved heterogeneity distribution,  $\sigma^2$ , is greater than zero (a testable hypothesis) then the model should include the unobserved heterogeneity distribution.

One complication that results from the inclusion of unobserved heterogeneity in the model is that the hazard rate ratios no longer represent proportional increases in the hazard rate associated with an explanatory variable. Consequently, we cannot directly compare the hazard ratios, but we can infer whether there were large differences in the size of the coefficient estimates from the two models.

## **DATA**

The data set consists of administrative records from the Ontario Workplace Safety & Insurance Board (WSIB) and were provided by the Institute for Work & Health. They consist of non-fatal lost-time workers' compensation claims for workers that were injured in the course of employment as the result of workplace violence. Our data do not include all the incidents of workplace violence that occurred in Ontario, only those that were in industries covered by workers' compensation legislation between January 1, 1996 and December 31, 1999.<sup>4</sup>

4. Workers' compensation legislation covers about 70 percent of the work force in Ontario. Most of the excluded workers are in banking and other financial services industries.

The types of workplace violence in this data set include physical acts, such as biting, beatings, stabbings, shootings and assaults. Our sample consists of 4,457 workers' compensation claims. The administrative data include some demographic information (age and gender), the part of the body injured, the nature of the injury, the type of violent act committed, and the worker's occupation as well as industry of employment at the four-digit level. In addition, the administrative records also contain the length of the absence from work (in days), the value of the workers' compensation wage loss benefits they received during that time and the value of the medical care they received as a result of the work-related act of violence. The length of the work absence reflects the number of the days the worker received temporary disability benefits, which are typically terminated when the worker returns to work.

The duration of work absences is as of December 31, 1999. This means that the duration of a work absence is censored for those workers who had not returned to work by that date. Some 4.5 percent of the claims in our sample are censored. One of the benefits of the hazard model specification is that it can easily accommodate these censored claim durations.<sup>5</sup>

Our hazard model includes controls for age at the time-of-accident and a dummy variable for males. These two variables are usually included in studies examining the duration of workers' compensation claims. Previous estimates suggest that males are more likely to return to work quickly and have shorter absences from work, while older workers are less likely to do so and, consequently, have longer work absences. We control for the economic incentives faced by workers with weekly benefits. Most research has found that increases in benefits are associated with a decrease in the probability of returning to work. Unfortunately, unlike many papers studying the duration of workers' compensation claims, we cannot include information on weekly earnings, as a measure of the opportunity cost of not working, because this information was not available in our data set. As a result, our specification differs slightly from other papers examining the duration of workers' compensation claims because they either included benefits and wages or the ratio of benefits to wages as explanatory variables. We also include dummy variables for the type of violent act committed. Specifically, we construct dummy variables for acts of violence that include beatings, stabbings, shootings and unspecified acts, with biting as the excluded reference group. The findings from descriptive profiles of the duration of work absences resulting from workplace violence show that the stabbings and shootings have the longest duration. As a result, we expect that the

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5. If we were to estimate a log duration regression with the censored data, the biases in the coefficient estimates would increase as the degree of censoring increases.

conditional probability of returning to work will be much lower for these types of injuries relative to our reference group.

The data set also contains detailed information on the part of the body injured as well as the nature of the injury. For the part of the body injured we create dummy variables to control for injuries to the head and neck, the trunk of the body, the upper extremities, the lower extremities, body systems, multiple body parts and other parts of the body. The controls for the nature of the injury include: traumatic injuries that were unspecified or not elsewhere classified; traumatic injuries to bone, nerves or spinal cord; traumatic injuries to muscles, tendons, ligaments and joints; traumatic injuries consisting of open wounds; traumatic injuries involving surface wounds and bruises; traumatic injuries involving burns; traumatic intracranial injuries; multiple traumatic injuries and disorders; other traumatic injuries and disorders; multiple conditions diseases and disorders; and, unknown conditions.

Our model also includes controls for the occupation of the worker. Although the claimants in our sample are employed in a diverse range of occupations, most are concentrated in nursing and law enforcement. We include dummy variables for the following occupations in our empirical model: registered nurses; nursing assistants; nurses' aides; teachers (pre-school, elementary and high school); high school teaching assistants; social workers; police officers; correctional officers; security guards; retail sales clerks; bus drivers; and unknown occupation, with other types of occupations as the reference group.

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## ***EMPIRICAL RESULTS***

### ***Descriptive Analysis***

The summary statistics in Table 1a provide information about the characteristics of the sample. The claims are spread fairly evenly across the years in our study period, although there was a slight drop in the number of claims in 1999. Our sample contains slightly more women than men (48 percent were men) and the average age was 37.6 years. The average duration of the absences from work is 40.9 days, with about 4.5 percent of our claim durations being censored. The average duration of the absences is about 50 to 68 percent longer than the duration of absences from work for other types of occupational injuries during the same period in Ontario.<sup>6</sup>

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6. This tabulation is a comparison based on information that is provided in the statistical supplements to the Ontario Workplace Safety & Insurance Board (WSIB) of Ontario's annual report. The WSIB of Ontario reports the average duration of payment of temporary

TABLE 1a  
Sample Characteristics

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>
Weekly benefits (dollars)	485.71	707.76
Age (time-of-accident)	37.63	10.07
Total health care payments (dollars)	694.61	5542.46
Male	0.4817	0.4997
Firm size (full-time equivalents)	572.38	1804.63
Year of Incident		
1996	0.2517	0.4341
1997	0.2642	0.4409
1998	0.2514	0.4338
1999	0.2327	0.4226
Type of violence		
Biting	0.0398	0.1955
Beating	0.4734	0.4993
Shooting	0.0068	0.0821
Stabbing	0.0074	0.0856
Unspecified	0.4726	0.4993
Occupation		
Other	0.2270	0.1754
Registered nurse	0.1264	0.3323
Nurse's assistant	0.0252	0.1568
Nurse's aide	0.1190	0.3238
Teacher	0.0367	0.1880
Social worker	0.0906	0.2871
Police	0.1384	0.3453
Corrections officer	0.0908	0.2874
Security guard	0.0452	0.2078
Sales clerk	0.0157	0.1244
High school teaching assistant	0.0260	0.1592
Bus driver	0.0301	0.1708
Unknown occupation	0.0289	0.1676
Part of body		
Head and Neck	0.2100	0.4073
Trunk	0.2667	0.4423
Upper extremity	0.1898	0.3922
Lower extremity	0.0864	0.2809
Body System	0.0476	0.2128
Multiple parts of body	0.1933	0.3949
Other part of body	0.0017	0.0418
Nature of injury		
Other type of injury	0.0625	0.0586
Trauma, unspecified/unclassified	0.0149	0.1213
Trauma to bones, nerves or spinal cord	0.0677	0.2513
Trauma to muscles, ligaments, tendons, joints, etc.	0.2950	0.4561
Trauma, open wound	0.0656	0.2476
Trauma, surface wound	0.2832	0.4506
Trauma, burns	0.0016	0.0394
Trauma, intracranial injuries	0.0200	0.1400
Trauma, multiple injuries	0.0763	0.2655
Trauma, other	0.1091	0.3118
Multiple diseases, conditions, disorders	0.0039	0.0622
Unknown Condition	0.0002	0.0139

The duration of the absences from work vary considerably according to the type of violence (see Table 1b). For example, individuals who were bitten missed an average of 17.7 days from work. At the other extreme, stabbings and shootings experience much longer absences, 98.1 and 127.1 days respectively, from work.

TABLE 1b  
Duration of Work Absences by Type of Violence (in days)

<i>Type of Violence</i>	<i>Mean</i>	<i>Standard Deviation</i>
All Types of Violence	40.90	97.46
Biting	17.68	54.72
Beating	36.17	89.36
Stabbing	98.11	136.15
Shooting	127.06	159.74
Unspecified	45.41	104.67

Most of the injuries suffered by workers in the sample are to the head or neck, trunk and the upper extremities (arms and hands) of the body. The injuries primarily consist of some sort of trauma (about 91 percent), which range from ligament damage to surface wounds. The average expenditure on health care for an injured worker in our sample is \$694.61, but there was a great deal of variation in the expenditures since the standard deviation of these expenditures is almost eight times larger than the mean. The composition of the occupations of the injured workers in these data is consistent with some of the findings in the literature on the incidence of workplace violence. For example, nursing (registered nurses, nurse's aides and assistants) and other health care workers comprise 31 percent of our sample, with registered nurses (12.6 percent) and nurse's aides (11.9 percent) the bulk of that total. This is similar to the findings in other studies that have found that workers in nursing jobs as well as other health care occupations are frequently victims of workplace violence. The other occupations that are common in our sample of workplace violence victims are police officers (13.8 percent), correctional officers (9.1 percent) and security guards (4.5 percent). Again this is consistent with previous studies that have found these occupations are at high risk of being exposed to workplace violence. Social workers also account for a large segment of the sample at about 9.1 percent. The relatively high percentage of social

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disability benefits for the first 12 weeks after injury or illness. In order to compare our durations with the WSIB definition, we computed them using the same definition as the WSIB.

workers in our data is consistent with other Canadian studies that have found that social work is a high-risk occupation.

*Hazard Estimates without Unobserved Heterogeneity Specification*

The estimates from the hazard model specifications without unobserved heterogeneity are presented in Table 2. We present coefficient estimates along with the hazard ratios, but focus our discussion primarily on the hazard ratios because they are easier to interpret. Our specification includes measures of weekly benefits, total health care expenditures, age at time-of-accident, firm size, a dummy variable for the year in which the incident occurred, a dummy variable indicating if the individual is a male, dummy variables controlling for the type of violence the worker experienced and occupation dummies. We estimated this specification including and excluding dummy variables for the type of injury and the nature of the injury. These estimates are presented primarily for comparative purposes because our preferred specification includes the unobserved heterogeneity distribution.

TABLE 2  
Estimates of Weibull Hazard Model  
(does not include unobserved heterogeneity distribution)

Variable Name	(1)		(2)	
	Coefficient Estimate	Percentage Change in Hazard Rate	Coefficient Estimate	Percentage Change in Hazard Rate
Weekly benefits	-0.0206*** (0.0061)	-2.04%	-0.0147** (0.0060)	-1.46%
Age (time-of-accident)	-0.0168** (0.0082)	-1.67%	-0.0175** (0.083)	-1.73%
Total health care payments	-0.0423*** (0.0019)	-4.14%	-0.0427*** (0.0019)	-4.18%
Male	0.0432 (0.0377)	4.41%	0.0226 (0.0387)	2.29%
Firm size	0.0003 (0.0002)	0.03%	0.0002 (0.0002)	0.03%
<i>Type of violence [Biting]</i>				
Beating	-0.3968*** (0.0819)	-32.75%	-0.3414*** (0.0959)	-28.92%
Shooting	-1.2160*** (0.2181)	-70.36%	-0.8706*** (0.2203)	-58.13%
Stabbing	-0.6370*** (0.1932)	-47.11%	-0.7769*** (0.1950)	-54.02%
Unspecified	-0.5371*** (0.0817)	-41.55%	-0.3782*** (0.0953)	-31.49%



TABLE 2 (continued)

Variable Name	(1)		(2)	
	Coefficient Estimate	Percentage Change in Hazard Rate	Coefficient Estimate	Percentage Change in Hazard Rate
<i>Occupation [Other]</i>				
Registered nurse	0.2160*** (0.0576)	24.11%	0.0812 (0.0584)	8.46%
Nurse's assistant	0.3509*** (0.1042)	42.03%	0.1901* (0.1048)	20.94%
Nurse's aide	0.3520*** (0.0593)	42.19%	0.1931*** (0.0605)	21.30%
Teacher	0.6119*** (0.0926)	84.40%	0.5104*** (0.0930)	66.60%
Social worker	0.3299*** (0.0627)	39.08%	0.2335*** (0.0631)	26.31%
Police	0.4623*** (0.0552)	58.77%	0.4024*** (0.0561)	49.55%
Corrections officer	0.1317** (0.0617)	14.07%	0.0512 (0.0621)	5.25%
Security guard	0.1581* (0.0812)	17.12%	0.0847 (0.0819)	8.84%
Sales clerks	-0.6005*** (0.1279)	-45.14%	-0.3293** (0.1304)	-28.05%
High school teaching assistant	0.4086*** (0.1071)	50.47%	0.3382*** (0.1076)	40.24%
Bus driver	0.0426 (0.0946)	4.35%	0.0548 (0.0946)	5.63%
Unknown occupation	0.2617*** (0.0967)	29.91%	0.1282 (0.0974)	13.68%
Year dummies	Yes		Yes	
Part of body dummies	No		Yes	
Nature of injury dummies	No		Yes	
Value of Log-Likelihood	-8173.70		-7984.77	
Function				
$\alpha$	0.7348** (0.0084)		0.7690** (0.0088)	

Notes: Excluded reference category in square brackets. Standard errors in parentheses; Triple asterisk (\*\*\*) denotes significant at 1% level; Double asterisk (\*\*) denotes significant at the 5% level; Single asterisk (\*) denotes significant at the 10% level. Percentage change in hazard rate is (hazard ratio - 1) \* 100%, where hazard ratio is the exponentiated value of the coefficient estimate.  $\alpha$  is the duration dependence parameter of the Weibull model.

Our estimate on weekly benefits suggests that a \$100 increase in weekly benefits would be associated with a statistically significant 2.0 percent decline in the hazard rate, which also corresponds with an increase in expected claim

duration. We also found a negative and statistically significant relationship between the health care expenditures the worker receives as a result of the injury and the hazard rate. Specifically, an extra \$100 in health care expenditures would be associated with a 4.1 percent decline in the hazard rate. If we interpret the health care expenditures as a proxy for severity, our estimate suggests, as expected, that more severe injuries result in longer absences from work.

We did not find any statistically significant differences in the hazard rate by gender. In addition, the estimates for the year dummies and the size of the firm also did not have a statistically significant effect on the hazard rate. However, we found that a 5-year increase in the age of the individual is associated with a statistically significant 1.7 percent decline in the hazard rate. This is consistent with other studies looking at the effects of age on the duration of absences from work (for example, among others, Campolieti, 2001, 2005 and Kralj, 1995). However, there are no comparable findings in the existing literature on workplace violence.

The variables controlling for the type of violence, with biting as the excluded reference group, all had a statistically significant effect on the hazard probability. The estimates were also consistent with expectations: the more violent acts were associated with larger effects on the hazard rate. In particular, we found that beatings were associated with a 28 percent decline in the hazard rate, stabbings were associated with a 47 percent decline in the hazard rate and shootings were associated with a 70 percent decline in the hazard rate. These estimates are all consistent with the summary statistics on the average duration of the work absences by type of violence, in which shootings had the longest duration.

The explanatory variables controlling for occupation type also produced some interesting effects on the hazard rate. We will provide a more detailed discussion of the estimates on the occupation dummies in the next section, which discusses the results with the unobserved heterogeneity distribution, because some of these estimates are sensitive to the presence of the unobserved heterogeneity distribution.

Adding controls for the nature of the injury and the part of the body injured, see column (2) in Table 2, changes the magnitude of the estimates to varying degrees.<sup>7</sup> However, most of the estimates tended to be smaller when we added the injury dummies to the specification, except for age and health care expenditures. The effects of changes in benefits, age and medical expenses from this specification do not differ a great deal from those that excluded the injury dummies. However, the estimates for the

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7. We do not discuss the estimates on the dummy variables for the type and nature of the injury, but almost all of these estimates were statistically significant.

type of workplace violence that occurred do differ somewhat from those we have already discussed. For example, beatings would be associated with a 29 percent decline in the hazard rate, stabbings would be associated with a 56 percent decline in the hazard rate and shootings would be associated with a 58 percent decline in the hazard rate. These estimates differed by 4 to 12 percentage points in absolute value from the estimates that excluded the injury controls. Similarly, we also observed some differences in the magnitude of the effects of the occupation dummies on the hazard, with many of the estimates experiencing fairly large changes in the effect on the hazard rate. For example, the effect of nurse's aides on the hazard rate was 20 percentage points smaller when we added the injury controls to the specification. Most of the estimates on the occupation dummy variables experienced changes of 8 to 15 percentage points in the effect on the hazard rate. However, including the injury dummies did not affect the signs of any of our estimates.

### *Hazard Estimates with Unobserved Heterogeneity Distribution*

Including the unobserved heterogeneity, i.e., the individual specific random effect with the gamma distribution, in the model specification had a much larger effect on the estimates. We present these estimates in Table 3. The estimates for the variance of the unobserved heterogeneity distribution indicate that it is statistically different from zero, so unobserved heterogeneity is likely to be a concern in these data. In the following discussion of the results in Table 3, we comment only on the differences in the magnitude of the coefficient estimates because, as we noted earlier, when the hazard model includes unobserved heterogeneity, the hazard ratios for a variable cannot be interpreted as proportional changes in the hazard rate. We also focus our discussion on a few key variables that are of particular interest.

TABLE 3  
**Estimates of Weibull Hazard Model**  
**(includes unobserved heterogeneity distribution)**

<i>Variable Name</i>	<i>(1) Coefficient Estimate</i>	<i>(2) Coefficient Estimate</i>
Weekly benefits	0.3400*** (0.0264)	0.3094*** (0.0256)
Age (time-of-accident)	-0.1084*** (0.0217)	-0.0983*** (0.0204)
Total health care payments	-0.0278*** (0.0023)	-0.0279*** (0.0025)
Male	-0.1574 (0.0989)	-0.1329 (0.0945)
Firm size	0.0015** (0.0006)	0.0017*** (0.0006)

TABLE 3 (continued)

<i>Variable Name</i>	(1) <i>Coefficient Estimate</i>	(2) <i>Coefficient Estimate</i>
<i>Type of violence [Biting]</i>		
Beating	-0.7794*** (0.1963)	-0.6977*** (0.2306)
Shooting	-3.8165*** (0.5704)	-2.7803*** (0.5765)
Stabbing	-2.3136*** (0.5036)	-2.1664*** (0.4766)
Unspecified	-1.1518*** (0.1978)	-0.8390*** (0.2300)
<i>Occupation [Other]</i>		
Registered nurse	-0.3409** (0.1547)	-0.3369** (0.1440)
Nurse's assistant	-0.0896 (0.2725)	-0.1689 (0.2548)
Nurse's aide	0.7145*** (0.1529)	0.5694*** (0.1450)
Teacher	0.9109*** (0.2257)	0.9219*** (0.2183)
Social worker	0.4175*** (0.1622)	0.3925*** (0.1520)
Police	-0.4269*** (0.1587)	-0.2153 (0.1483)
Corrections officer	-0.2029 (0.1687)	-0.1470 (0.1574)
Security guard	0.2440 (0.2189)	0.2697 (0.2019)
Sales clerks	-1.3689*** (0.3637)	-1.0824*** (0.3506)
High school teaching assistant	1.1095*** (0.2739)	0.9926*** (0.2584)
Bus driver	-0.4188* (0.2539)	-0.1198 (0.2437)
Unknown occupation	0.4801* (0.2558)	0.4876** (0.2421)
Year dummies	Yes	Yes
Part of body dummies	No	Yes
Nature of injury dummies	No	Yes
Value of Log-Likelihood function	-7807.77	-7649.28
$\alpha$	2.1007** (0.0857)	2.0060** (0.0793)
$\sigma^2$	3.0019** (0.1917)	2.6045** (0.1707)

Notes: Excluded reference category in square brackets. Standard errors in parentheses; Triple asterisk (\*\*\*) denotes significant at 1% level; Double asterisk (\*\*) denotes significant at the 5% level; Single asterisk (\*) denotes significant at the 10% level. As we noted in the text, the coefficient estimates from the hazard model cannot be interpreted as a percentage change in the hazard rate like those in Table 2.  $\alpha$  is the duration dependence parameter of the Weibull model and  $\sigma^2$  is the variance of the unobserved heterogeneity distribution.

The effect of benefits on the hazard probability is positive and statistically significant. This differs from its counterpart in Table 2, which was negative. The coefficient estimate, 0.31, on the benefit variable in Table 3 is also a great deal larger than the value from the specifications that did not include unobserved heterogeneity in Table 2. Our specification omits a control for wages because it is not available in our data. The wage variable is a measure of the opportunity cost of not working. The lack of a control for this effect might be confounding our estimate on the benefit variable because benefits are expressed as a percentage of wages up to a statutory maximum dollar amount. This may be a plausible explanation for this unexpected sign on this estimate.

Unlike the estimates in Table 2, firm size now also has a statistically significant effect on the hazard probability, with the results indicating that workers from larger firms would have shorter absences from work. The size of the coefficient estimates on the type of violence in Table 3 also differed substantially from those in Table 2, with many of the coefficient estimates being 2 to 3 times larger in magnitude.

The estimates on the benefit, firm size and type of violence variables illustrate the extent of the biases that can arise when the model is misspecified and does not include the unobserved heterogeneity distribution.

The estimates on the controls for occupation type in Table 3 also differed both in the magnitude of the estimates as well as in the direction of the effect on the hazard rate relative to their counterparts from the specification that excluded the unobserved heterogeneity distribution in Table 2.

Previous studies on workplace violence have identified nurses and health care workers as "high-risk" occupations. Our estimate on the dummy variable for registered nurses indicates they are associated with a decrease in the hazard rate or, equivalently, longer absences from work. The nurse's assistant dummy variable did not have a statistically significant estimate. However, we found that nurse's aides would be associated with increases in hazard rates or shorter absences from work.

Police officers, correctional officers and security guards were also frequently victims of violence in our study and have also been identified as high-risk groups in previous work. The estimates on the dummies for security guards and correctional officers are not statistically significant. However, we did find that police officers are associated with a decrease in the hazard rate or, equivalently, longer absences from work.

The estimates on the controls for teachers, high school teaching assistants and social workers also indicate that these occupations would be associated with relatively higher conditional probabilities of exiting (i.e.,

returning to work more quickly) and, consequently, have shorter absences from work.

There were also some statistically significant estimates on the remaining occupation dummies. Sales clerks and bus drivers were associated with decreases in the hazard rate (and so longer absences from work), but the estimate for the bus drivers was only statistically significant at the 10 percent level. This unknown occupation group was associated with a statistical increase in the hazard probability.

Adding the controls for the part of the body injured and the nature of the injury to the model with the unobserved heterogeneity (see column (2) in Table 3) also affected the estimates for the occupation controls. The estimates from the controls for police officers and correctional officers were still both negative, but neither was statistically significant once the injury dummies were added to the specification. The estimate for registered nurses in column (2) is very similar to the estimate in column (1). In addition, some of the estimates that were statistically significant without the injury controls were no longer significant, e.g., police officers and nurse's assistants.

## ***DISCUSSION***

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The sensitivity of many of our estimates, particularly those for the type of occupation, to the inclusion of the unobserved heterogeneity distribution suggests that unobservables can have a substantial impact on the duration of these work absences following an act of violence. Perhaps, as argued by, among others, Barling (1996), Budd, Arvey and Lawless (1996) and Rogers and Kelloway (1997), workplace violence may also create stress and mental health problems in addition to the bodily harm. Excluding the unobserved heterogeneity distribution from the model specification produced estimates that indicated the absences from work for some high-risk occupations (e.g., police officers and nurses) would be shorter than would be observed if the model specification included unobserved heterogeneity. This suggests that hazard estimates of the duration absences from work should include unobserved heterogeneity to at least try to accommodate some of the consequences of workplace violence on the hazard probability, when data on these factors is not available.

One of our key findings on the determinants of the length of absences from work following an episode of workplace violence concerns health care expenditures. As expected, larger health care expenditures are associated with longer absences from work. This is not surprising because previous work has found that workplace violence contributes to more physical and mental health problems.

We also found some statistically significant differences in the hazard rate by occupation type. Nurses and police officers, which have been identified as high-risk occupations in previous research and comprise about 26 percent of our sample, are prone to longer absences from work following workplace violence. These longer absences from work could reflect the impact of workplace violence on organizational and personal outcomes. For example, as we discussed earlier, Rogers and Kelloway (1997) and Schat and Kelloway (2000) have both found that workplace violence contributes to an increase in turnover intentions and physical health problems as well as a decrease in mental health. Barling, Rogers and Kelloway (2001) found workplace violence predicts fear of its recurrence in the workplace, which in turn contributes to increased anger and anxiety in victims as well their perceptions of injustice. A combination of these factors could be contributing to longer absences from work for these occupations because victims of workplace violence may be very reluctant to return to work quickly.

Our estimates also indicated that more severe forms of workplace violence (i.e., shootings and beatings) would be associated with longer absences from work. One plausible interpretation of this finding is that the increase in physical problems and the decrease in mental health that follow an episode of workplace violence become more severe and serious as the type of violence intensifies.

Another interesting finding in this paper relates to the relationship between firm size and the length of absences from work. We found that workers from larger firms would have shorter absences from work. These shorter absences from work could be the result of several plausible factors. First, larger firms have a greater ability to reassign victims of workplace violence to other jobs that take them immediately out of the environment where they experienced the violence. Second, large firms can also be more likely to offer phased-in work, i.e., a few days a week, to victims if they still have trouble dealing with the aftermath of the workplace violence. Third, larger firms could also be able to offer employee assistance programs or in-house counseling support to help workers cope with any stress and anxiety they may have as a result of the workplace violence. Fourth, larger firms also have the ability to act with interventions (for example, immediately sending counselors or other professional staff) to mitigate the adverse psychological effects of the violence. Unfortunately, we do not have the information in our data set to allow us to determine which of these potential explanations contribute to shorter absences from work. Moreover, the existing literature on workplace violence has not examined the effect of firm size on individual and organizational outcomes, so this would be an interesting direction for future research to explore.

### **CONCLUDING REMARKS**

We studied the duration of absences from work following an episode of workplace violence using data from the administrative records of the Workplace Safety & Insurance Board of Ontario. Our results suggest a number of important relationships between individual and claim characteristics and the duration of absences from work. First, we find that increasing the severity of the injury, as measured by total health care expenditures, is associated with increases in the length of absences from work. Second, we found that the most violent acts would be associated with the largest decreases in the hazard rate and also result in longer absences from work. Third, we found some significant differences in the hazard rate by occupation type. In particular, high-risk occupations, such as nurses and police officers, have longer absences from work. Fourth, we found that workers from larger firms had shorter absences from work following an episode of workplace violence.

This paper has contributed some valuable information about the factors influencing the length of absences from work following an episode of workplace violence. Consequently, there is a better understanding of the factors affecting the incidence of violence acts at work, the length of absences from work following an episode of violence as well as the consequences of the workplace violence. However, one area that has not been studied is what services should be provided to workers who have experienced this violence. To the extent that these services can reduce the duration of absences from work, they are of great interest to employers and workers' compensation boards. Perhaps more importantly, they can help victims return to work and their lives more quickly by reducing the adverse consequences of workplace violence. This is a promising and important direction for future research.

### **■ REFERENCES**

- ASSOCIATION OF WORKERS' COMPENSATION BOARDS OF CANADA. 1999. *Work Injuries and Diseases 1996-1998*. Mississauga, Ont.: National Work Injuries Statistics Program.
- BAKER, Michael and Samuel REA, Jr. 1998. "Employment Spells and Unemployment Insurance Eligibility Requirements." *Review of Economics and Statistics*, 80 (1), 80-94.
- BARLING, Julian. 1996. "The Prediction, Experience and Consequence of Workplace Violence." *Violence on the Job: Identifying Risks and Developing Solutions*. G. Vandenbos and E. Bulato, eds. Washington, D.C.: American Psychological Association, 29-41.
- BARLING, Julian, A. Gail ROGERS, and Kevin E. KELLOWAY. 2001. "Behind Closed Doors: In-Home Workers' Experience of Sexual Harassment and



- Workplace Violence.” *Journal of Occupational Health Psychology*, 6 (3), 255–269.
- BENSLEY, Lillian, Nancy NELSON, Joel KAUFMAN, Barbara SILVERSTEIN, John KALAT and Joanne SHIELDS. 1997. “Injuries Due to Assaults on Psychiatric Hospital Employees in Washington State.” *American Journal of Industrial Medicine*, 31 (1), 92–99.
- BUDD, John W., Richard D. ARVEY and Peggy LAWLESS. 1996. “Correlates and Consequences of Workplace Violence.” *Journal of Occupational Health Psychology*, 1 (2), 197–210.
- CAMPOLIETI, Michele. 2001. “Recurrence in Workers’ Compensation Claims: Estimates from A Multiple Spell Hazard Model.” *Journal of Risk and Uncertainty*, 23 (1), 75–94.
- CAMPOLIETI, Michele. 2005. “Unions and the Duration of Workers’ Compensation Claims.” *Industrial Relations*, 44 (4), 625–653.
- CAMPOLIETI, Michele, Robert HEBDON and Douglas HYATT. 2005. “Strike Incidence and Strike Duration: Some New Evidence from Ontario.” *Industrial and Labor Relations Review*, 58 (4), 610–630.
- CHAPPELL, Duncan and Vittorio DI MARTINO. 1998. *Violence at Work*. 2<sup>nd</sup> edition. Geneva, Switzerland: International Labour Office.
- CHENIER, Errol. 1998. “The Workplace: A Battleground for Violence.” *Public Personnel Management*, 27 (4), 557–568.
- DUPRE, Kathryn E. and Julian BARLING. 2003. “Workplace Aggression.” *Misbehavior and Dysfunctional Attitudes in Organizations*. A. Sagie, S. Stashevsky and M. Koslowsky, eds. New York: Palgrave, 13–32.
- DUPRE, Kathryn E. and Julian BARLING. 2006. “Predicting and Preventing Supervisory Workplace Aggression.” *Journal of Occupational Health Psychology*, 11 (1), 13–26.
- ELLIOTT, Pamela P. 1997. “Violence in Health Care: What Nurse Managers Need to Know.” *Nursing Management*, 28 (12), 38–41.
- GATES, David M. 2004. “The Epidemic of Violence Against Health Care Workers.” *Occupational Environmental Medicine*, 61 (11), 649–650.
- GREENBERG, Liane and Julian BARLING. 1999. “Predicting Employee Aggression Against Coworkers, Subordinates and Supervisors.” *Journal of Organizational Behavior*, 20 (6), 897–913.
- GUNDERSON, Morley and Angelo MELINO. 1990. “The Effects of Public Policy on Strike Duration.” *Journal of Labor Economics*, 8 (3), 295–316.
- HAM, John C. and Samuel A. REA, Jr. 1987. “Unemployment Insurance and Male Unemployment in Canada.” *Journal of Labor Economics*, 5 (3), 325–353.
- HESKETH, Katherine L., Susan M. DUNCAN, Carol A. ESTABROOKS, Marlene A. REIMER, Phyllis GIOVANNETTI, Kathryn HYNDMAN and Sonia ACORN. 2003. “Workplace Violence in Alberta and British Columbia Hospitals.” *Health Policy*, 63 (3), 311–321.
- ISLAM, Syed S., Surender R. EDLA, Priscah MUJURU, Edward J. DOYLE, and Alan M. DUCATMAN. 2003. “Risk Factors for Physical Assault: State-Managed

- Workers' Compensation Experience." *American Journal of Preventative Medicine*, 25 (1), 31–37.
- JOCKIN, Victor, Richard D. ARVEY and Matt McGUE. 2001. "Perceived Victimization Moderates Self-Reports of Workplace Aggression and Conflict." *Journal of Applied Psychology*, 86 (6), 1262–1269.
- KRALJ, Boris. 1995. "Experience Rating of Workers' Compensation Insurance Premiums and the Duration of Workplace Injuries." *Research in Canadian Workers' Compensation*. T. Thomason and R.P. Schakowsky, eds. Kingston, Ont.: IRC Press, 106–122.
- LEBLANC, Manon M. and E. Kevin KELLOWAY. 2002. "Predictors and Outcomes of Workplace Violence and Aggression." *Journal of Applied Psychology*, 87 (3), 444–453.
- LEBLANC, Manon M. and Julian BARLING. 2004. "Workplace Aggression." *Current Directions in Psychological Science*, 13 (1), 9–12.
- LORD, Vivian. 1998. "Characteristics of Violence in State Government." *Journal of Interpersonal Violence*, 13 (4), 489–503.
- MACDONALD, Grant and Frank SIROTICH. 2005. "Violence in the Social Work Workplace: The Canadian Experience." *International Social Work*, 48 (6), 772–781.
- MCCALL, Brian P. and Irwin B. HOROWITZ. 2004. "Workplace Violence in Oregon: An Analysis Using Workers' Compensation Claims from 1990–1997." *Journal of Occupational and Environmental Medicine*, 46 (4), 357–366.
- NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH. 1996. *Current Intelligence Bulletin 57: Violence in the Workplace Risk Factors and Prevention Strategies*. Washington, D.C.: NIOSH.
- PIZZINO, Anthony. 1993. *Report on Canadian Union of Public Employees National Health and Safety Survey of Aggression Against Staff*. Ottawa: CUPE.
- ROGERS, Kimberley-Ann and E. Kevin KELLOWAY. 1997. "Violence at Work: Personal and Organizational Outcomes." *Journal of Occupational Health Psychology*, 2 (1), 63–71.
- SAARELA, Kaija Leena and Nina ISOTALUS. 1999. "Workplace Violence in Finland: High-Risk Groups and Preventive Strategies." *American Journal of Industrial Medicine*, 36 (S1), 80–81.
- SCHAT, Aaron C.H. and E. Kevin KELLOWAY. 2000. "Effects of Perceived Control on the Outcomes of Workplace Aggression and Violence." *Journal of Occupational Health Psychology*, 5 (3), 386–402.
- STATISTICS CANADA. 2005. *Findings from the 2005 National Survey of the Work and Health of Nurses*. Ottawa: Health Canada.
- STATISTICS CANADA. 2007. *Criminal Victimization in the Workplace 2004*. Ottawa: Canadian Centre for Justice Statistics.
- STIRLING, Grant, Joanne E. HIGGINS, and Mathew W. COOKE. 2001. "Violence in A&E Departments: A Systematic Review of the Literature." *Accident and Emergency Nursing*, 9 (1), 77–85.

## **RÉSUMÉ**

### **La violence sur les lieux de travail et la durée des réclamations des travailleurs**

Une étude récente de Statistique Canada (2007) offre une illustration alarmante de l'ampleur de la victimisation criminelle sur les lieux de travail. Les Canadiens y signalent quelque 350 000 incidents de violence dans leurs établissements. Selon Statistique Canada (2007 : 6), ces incidents représentent 17 % de tous les incidents déclarés de victimisation avec violence, incluant l'agression sexuelle, le vol et les voies de fait. Cette étude démontre que la violence sur les lieux de travail est beaucoup plus répandue que les gestes isolés, spectaculaires et parfois mortels de violence sur les lieux de travail signalés à l'occasion dans les quotidiens.

L'étude de Statistique Canada révèle également que certaines occupations sont plus exposées à la violence sur les lieux de travail que d'autres. Les travailleurs de l'aide sociale et de la santé, ainsi que ceux des services alimentaires et du logement, sont particulièrement exposés à des gestes de violence dans leurs établissements.

Les victimes de gestes de violence sur les lieux de travail sont traitées de façon différente de celles qui ont subi des actes de violence hors des lieux de travail, en ce sens que toute lésion d'ordre physique, psychologique et émotionnelle, que toute perte de gains due à une absence du travail comme conséquence de la violence sont indemnisables en vertu du système d'indemnisation des travailleurs. Ce système d'indemnisation des travailleurs est créé par voie législative selon un programme d'assurance sans égard à la responsabilité, qui compense des frais de réhabilitation soit occupationnelle, soit médicale, qui prévoit des dédommagements en cas de perte de rémunération dans le cas de travailleurs qui sont devenus inaptes suite à une lésion ou une maladie liée travail.

En matière d'indemnisation des travailleurs, le législateur aurait intérêt à comprendre les causes et les conséquences des incidents de violence sur les lieux de travail. Cette compréhension pourrait guider les autorités en matière d'indemnisation des travailleurs dans l'élaboration des stratégies visant à prévenir la violence dans les établissements et à aider à en limiter les conséquences liées à l'incapacité, incluant les pertes de temps au travail. L'intérêt primordial pour les autorités responsables de l'indemnisation des travailleurs à l'endroit d'une meilleure compréhension de la violence est certainement de mieux assurer la protection des travailleurs. Mais, il y a aussi un intérêt de nature financière. Évidemment, aucune indemnisation ne serait nécessaire s'il n'y avait pas de violence. Cependant, même lorsqu'un acte de violence se produit, le fait de promouvoir ou de faciliter le retour

au travail en temps opportun pourrait réduire les coûts des paiements de remplacement du revenu prévus dans le système d'indemnisation des travailleurs.

Alors qu'un nombre d'études antérieures ont documenté la fréquence des actes de violence dans les établissements et quelques unes des conséquences pour les victimes, il n'y a eu que très peu de recherches sur le déclencheur principal des coûts financiers associés à la violence sur les lieux de travail, c'est-à-dire la durée des absences du travail engendrée par les conséquences de la violence en termes d'invalidité. Cet essai présente une évaluation des causes du temps de travail perdu à la suite d'un geste de violence sur les lieux de travail. Nous utilisons un modèle de risque pour rendre compte de la durée de ces absences du travail. Nous contrôlons l'élément d'hétérogénéité inobservé qui peut fausser les évaluations des paramètres du modèle de risque. Nous constatons que, lorsque la variable hétérogénéité inobservée est incluse dans les caractéristiques du modèle, certaines évaluations concernant les occupations à haut risque (par exemple, les infirmières et les agents de police) présentent des différences importantes quand on les compare à leurs homologues dans le même modèle, mais dont le devis descriptif ne fait pas état de l'hétérogénéité inobservée. Cela nous laisse croire que les facteurs passés sous silence, tels que le stress et les problèmes psychologiques peuvent exercer une influence importante sur les évaluations.

Nous avons obtenu ces évaluations en utilisant des données tirées des archives administratives de la Commission ontarienne de la sécurité professionnelle et de l'assurance contre les accidents du travail. Elles font état des réclamations d'indemnisation des travailleurs suite à des incidents non mortels comportant des pertes de temps pour les travailleurs qui ont subi des lésions au cours de leur travail résultant de gestes de violence. Les types de violence qu'on retrouve dans ces données comprennent des actes physiques, tels que des morsures, des raclées, des coups de couteau ou de fusil et des voies de fait. Notre échantillon comprend 4 457 réclamations d'indemnisation des travailleurs.

La durée des réclamations qui proviennent d'actes de violence au travail mérite qu'on lui accorde une analyse distincte de celle des autres types de lésions associées au travail (ces dernières faisant l'objet d'une littérature assez remarquable). Les données retenues dans cette étude indiquent que la durée des absences du travail résultant d'incidents de violence sur les lieux du travail est cinquante pour cent plus longue que celle des absences dues à d'autres lésions ou maladies professionnelles.

Nos principales conclusions d'ordre empirique laisse croire à la présence d'une quantité de relations significatives entre les caractéristiques des individus, les réclamations et la durée des absences du travail venant de

la violence au travail. En premier lieu, nous constatons que le fait d'accroître la gravité de la lésion, évaluée en termes de dépenses totales en frais de santé, est relié à des augmentations de la durée des absences du travail. En deuxième lieu, nous découvrons que les incidents les plus violents auraient tendance à s'associer à des diminutions les plus prononcées du taux de risque et résulteraient dans des absences plus longues du travail. En troisième lieu, nous avons observé des différences significatives dans les taux de risque par type d'occupation. Plus précisément, les occupations à haut risque, telles que les infirmières et les agents de police, présentent des dossiers d'absences du travail plus longues. Quatrièmement, nous avons constaté que les travailleurs à l'emploi des établissements plus vastes ont un fichier d'absences plus courtes au cours de la période suivant un épisode de violence au travail.

Ce travail fournit de l'information valable sur les facteurs qui ont un impact sur la longueur des absences du travail à la suite d'un incident de violence au travail. Par conséquent, il conduit à une meilleure compréhension des facteurs influençant la survenance d'incidents de violence au travail et la durée des absences du travail suivant un épisode de violence. Cependant, un secteur qui n'a pas été abordé concerne le type de services qui devraient être offerts aux travailleurs victimes de violence. Dans la mesure où ces services peuvent réduire la durée des absences du travail, on y trouve là un grand intérêt à la fois pour les employeurs et les commissions d'indemnisation. Peut-être et de façon plus significative, ils pourraient aider les victimes dans leur vie personnelle et à un retour au travail plus rapide par une réduction des conséquences néfastes de la violence au travail. Voilà une avenue importante et prometteuse pour la recherche ultérieure.